RESEARCH AND DEVELOPMENT SUMMARY

The Idaho National Engineering and Environmental Laboratory's (INEEL) principal mission is to develop and demonstrate advanced nuclear technologies that provide clean, abundant, affordable, and reliable energy. The laboratory also conducts basic and applied research to protect the nation's critical infrastructure and enhance national security, facilitate DOE's legacy cleanup and stewardship responsibilities, and advance energy-related sciences.

The INEEL takes on challenging problems, effectively collaborates to assure maximum return on investment, and puts science to work. Our goal now, as it has been from the beginning, is to be the science and applied engineering laboratory where ideas are turned into reality—providing solutions to real-world problems. To achieve our assigned missions, we will develop the next-generation technologies of a new nuclear- and hydrogen-powered economy and an unprecedented era of domestic energy security.

Historical Perspective

Well over a half-century ago, the fledgling Atomic Energy Commission had a grand vision for its newest national asset in Idaho—to be the place where new uses of nuclear energy could be developed, field tested, and proven. At this site, then known as the National Reactor Testing Station, the best minds and most capable companies in the nation turned their ideas into reality.

From those nuclear roots a multiprogram national laboratory—the Idaho National Engineering and Environmental Laboratory—evolved that built on its expertise in areas such as sensors, chemistry, systems integration and operation, and materials science to serve ever-broadening national needs.

Because of this well-established operational approach, the Secretary of Energy assigned the INEEL the role of the nation's leading center for nuclear energy research and development in July 2002. In this capacity, we're being looked to for science-based solutions—best approaches that come through leveraging our own resources as well as those of our sister national laboratories. And we're research partners with regional universities on a wide range of environmental, energy, and security-related initiatives.

We know and demonstrate daily that such collaboration and strategic relationships are pivotal to increasing the value of science and technology delivered to the nation as one of the U.S. Department of Energy's federally-funded research and development centers.

Planning Assumptions and Goals

The Laboratory's annual strategic planning process culminates with the issuance of strategic guidance by senior management. Associate laboratory directors and their staffs, working with the Strategic Planning Office, develop elements that are the core of the laboratory's scientific and technical vision.

Significant changes in the Laboratory's scientific and technical vision and strategic plan from Fiscal Year (FY)-03 include the shift in overall INEEL focus from environmental research and development (R&D) to nuclear energy R&D and critical infrastructure assurance as well as inclusion of a new hydrogen initiative.

FY-04 planning assumptions are:

- Total Laboratory-Directed Research and Development (LDRD) funding will decrease beginning in FY-04 to $12M
- Environmental Systems Research and Analysis (ESRA) funding will be eliminated as of FY-04
- The Idaho Completion Project (ICP) and the INEEL will be operated as separate entities by Bechtel BWXT Idaho, LLC (BBWI), as begun in July 1, 2003
- INEEL R&D support to the ICP will likely decline beginning in FY-04
- Department of Energy, Office of Nuclear Energy (NE) funding is expected to increase substantially beginning in FY-04 and FY-05
- NE recognizes the need for significant investment in revitalization of INEEL infrastructure
- A new contract will be awarded for a reconfigured Idaho National Laboratory as of October 1, 2004.

FY-04 goals are to:

1. Assure the nation's energy security by developing advanced nuclear energy systems and improving the efficiency, reliability, and safety of current energy technologies
2. Begin development and demonstration activities for the advanced fuel-cycle systems (FY-04–FY-08)
3. Provide safe and efficient state-of-the-art research capabilities for nuclear fuels, materials, and systems testing and evaluation
4. Provide innovative science and engineering solutions to address challenges to the nation's critical infrastructure
5. Facilitate completion of DOE's legacy cleanup and stewardship
6. Conduct science and identify technologies that underpin solutions to DOE's mission (reliable energy, national security, energy-related science)
7. Continue to develop a high-performance, responsible, and accountable multiprogram national laboratory that is responsive to mission needs and demonstrates operational excellence
8. Strengthen national and international partnerships to address DOE's R&D needs.

Initiatives

The planning assumptions listed above form the basis for developing goals and strategies. The Laboratory's R&D efforts will emphasize nuclear reactor technology and R&D, advanced fuels, hydrogen infrastructure and production, and subsurface science. In support of its goals, the INEEL has identified five initiatives.

1. Advanced Nuclear Energy Initiative
2. Critical Infrastructure Protection Initiative
3. Subsurface Science Initiative
4. Hydrogen Initiative
5. Advanced Computing and Collaboration.

Annual Work Plan for INEEL Research and Development

The ensuing pages expand on the laboratory initiatives stated above. INEEL will build on its historic strengths, physical assets, and organizational strengths to meet pressing national needs. By focusing on advanced nuclear energy, critical infrastructure assurance, hydrogen generation, and subsurface science, the Laboratory will apply its unique blend of resources to solve some of the most difficult challenges of our time.

This Annual Work Plan presents the mission, descriptions of work, projected business volume, and strategic staffing plan for the work that is projected for FY-04 for the INEEL in Energy and Environmental Sciences, Energy and Engineering Technology, Nuclear Energy, National Security, and support to the Idaho Completion Project.

Business Volume and Customer Base

Business volume has grown 15% over the past three years, from $98.8 million in FY-99 to $115.3 million in FY-02 (see Figure 1). INEEL has attracted a broad customer base, as shown in Figure 2, that will help to ensure the long-term growth and sustainability of the Laboratory. These results are evidence that an effective business planning process is in place and working to produce results.

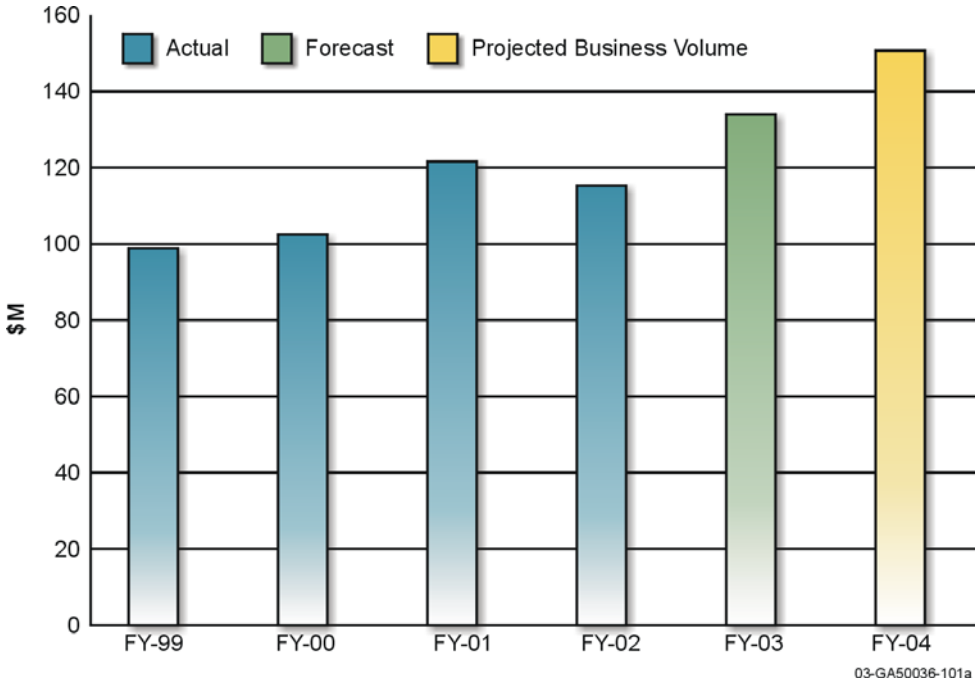

Figure 1. R&D business volume history from FY-99, projected through FY-04, shows steady growth.

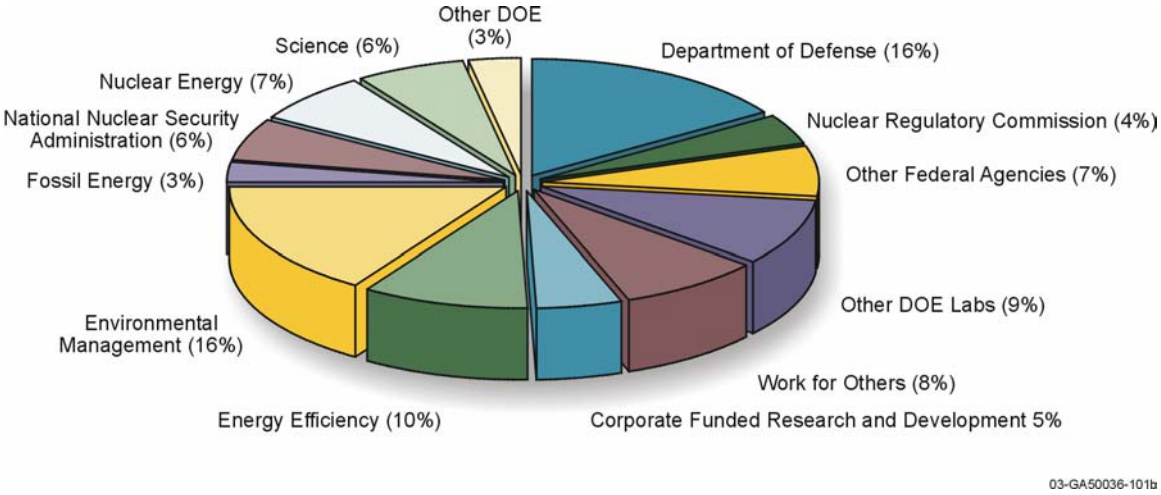

Figure 2. R&D has a broad customer base (data for July 2003).